Entergy

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10 CFR 50.73

GNRO-2019/00032

July 9, 2019

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Grand Gulf Nuclear Station, Unit 1, Licensee Event Report 2019-002-00, Manual Reactor Shutdown Due to Loss of Service Water

Docket No. 50-416
License No. NPF-29

Attached is Licensee Event Report 2019-002-00, Manual Reactor Shutdown Due to Loss of Service Water. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A) for an even or condition that resulted in an actuation of the reactor protection system and initiation of the Standy Service Water system, as specified by 10 CFR 50.73(a)(2)(iv)(B); and 10 CFR 50.73(a)(2)(v)(D) for the potential to prevent fulfillment of a safety function based on drywell temperature.

This letter contains no new commitments. If you have any questions or require additional information, please contact Jim Shaw at 601-437-2103.

Sincerely,

Eric A. Larson
EAL/dre

Attachment: Licensee Event Report 2019-002-00

(See Next Page)

cc: NRC Region IV - Regional Administrator
NRC Senior Resident Inspector, Grand Gulf Nuclear Station
NRR Project Manager

GNRO-2019/00032

Attachment
Licensee Event Report 2019-002-00

NRC FORM 366 (04-2018) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Grand Gulf Nuclear Station, Unit 1	05000416	1 OF 3

4. Title

Manual Reactor Shutdown Due to Loss of Service Water

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
									N/A	05000N/A
05	12	2019	2019	- 002	- 00	07	09	2019	Facility Name	Docket Number
									N/A	05000N/A

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. Power Level	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(iii)
		☐ 50.73(a)(2)(i)(C)	☐ Other (Specify in Abstract below or in NRC Form 366A	

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Jim Shaw, Manager Regulatory Assurance	(601) 437-2103

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To ICES	Cause	System	Component	Manufacturer	Reportable To ICES
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No		N/A	N/A	N/A

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On May 12, 2019, Grand Gulf Nuclear Station (GGNS) shutdown the reactor by moving the mode switch from RUN to SHUTDOWN due to a partial loss of Plant Service Water (PSW), in accordance with plant procedures.

The partial loss of PSW was caused by a partial loss of power to PSW pumps, and degraded capacity in one PSW well. Loss of power to plant service water pumps was caused by animal intrusion onto electrical service lines.

Drywell temperature briefly exceeded the technical specification limit but did not cause a loss of safety function, and Standby Service Water (SSW) was manually initiated to supply engineered safety function room and control room coolers.

Completed corrective actions include restoration of electrical service, procedure revisions, and training. Planned corrective actions include improved plant and engineering focus on degraded systems, installation of more robust electrical service, and a revised maintenance strategy for plant service water components.

This report is made pursuant to 10 CFR 50.73(a)(2)(iv)(A) for the actuation of the reactor protection system and initiation of SSW per 10 CFR 50.73(a)(2)(iv)(B); and 10 CFR 50.73(a)(2)(v)(D) for the potential loss of safety function.

There were no consequences to the general safety of the public, nuclear safety, industrial safety and radiological safety for this event.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station, Unit 1	05000-416	2019	- 002	- 00

NARRATIVE

Plant Conditions:

Grand Gulf Nuclear Station (GGNS) Unit 1 was operating at approximately 100 percent power in MODE 1. There were no structures, systems, or components that were inoperable that contributed to the event.

Description:

On May 12, 2019, at 10:18 CST, the GGNS experienced an electrical Balance Of Plant 23 buss lockout (EA). This lockout was due to an electrical fault caused by a bird interacting with overhead transmission lines. All systems responded as designed.

The electrical buss lockout de-energized enough Plant Service Water (PSW)(KG) pumps, combined with a degraded capacity on one well, to cause an unacceptable increase in component cooling water temperature and turbine building cooling water temperature. Based on the increase in these cooling system temperatures, and in accordance with plant procedures, operators moved the mode switch from RUN to SHUTDOWN on May 12, 2019 at 1039.

During the event the partial loss of PSW induced a lockout of the drywell chillers and drywell temperature exceeded the technical specification limit of 135 degrees F.

Due to reduced plant service water pressure, standby service water was manually initiated to provide cooling to the control room coolers (VI) and engineered safety function room coolers(VF).

All other plant systems functioned as designed.

Reportability:

This event was reported under 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72(b)(3)(iv)(A) for an event resulting in an actuation of the reactor protection system, and 10 CFR 50.72(b)(3)(v)(C) for a potential loss of safety function due to increased drywell temperature. The event notification is 54062.

This report is made pursuant to 10 CFR 50.73(a)(2)(iv)(A) for the actuation of the reactor protection system (manual shutdown via mode switch), and 10 CFR 50.73(a)(2)(iv)(A) for the manual initiation of standby service water,

This report is also made pursuant to 10 CFR 50.73(a)(2)(v)(D) for the potential to prevent fulfillment of a safety function (drywell temperature greater than 135 degrees F, which exceeds the design basis accident assumptions for mitigation of a small break loss of coolant accident in the drywell.)

Direct Cause:

The direct cause(s) of the event were the ground fault on the BOP 23 feeder line caused by animal intrusion, and the degraded specific capacity of one radial well.

Root Cause:

The Root Cause of the event (inadequate plant service water flow resulting in manual reactor shutdown) is that engineering programs and processes for risk assessment lacks adequate guidance to identify and assess aggregate risk due to the combination of extended operation of 1) a temporary power modification for power plant service water

pumps via overhead feed, and 2) one degraded radial well specific capacity, resulting in the station not having bridging or mitigating actions in place to reduce reactor power after a partial loss of plant service water.

Completed Corrective Actions:

- Removed wire fencing on power poles which was related to direct cause of ground fault.
- Adverse Condition Monitoring Plan for BOP 23 power lines and radial well #3 specific capacity.
- Revised procedures to address a graded approach to loss of plant service water
- Provided training to control room shift operators on lockout restoration demonstration.

Planned Corrective Actions to Preclude Recurrence:

The following corrective actions to preclude recurrence are planned, subject to changes per the appropriate corrective action process:

- Add requirements for periodic aggregate reviews of the Risk Map items as well as recommended lower tier items (key system health items, ODMIs, PDM Watch List, etc.) for the development and implementation of mitigation and bridging strategies for known vulnerabilities / risk issues.
- Add requirements for review and update existing strategies for consideration of impacts from changes in plant conditions (i.e. changes in equipment conditions, new items identified, actions being extended, probability for reoccurrence or failure); and
- Establish recommendations and guidelines for the performance of periodic reviews by a cross-discipline team including, but not limited to, Operations, System Engineering, and Maintenance.

Planned Corrective Actions:

The following actions are planned, subject to changes per the appropriate corrective action process:

- Replace the appropriate power feed with a more robust design.
- Develop and execute a maintenance strategy for the plant service water system major components

Safety Significance:

All safety systems responded as designed. There were no other actual consequences to safety of the general public, nuclear safety, industrial safety and radiological safety for this event. There were no abnormal radiological releases caused by this event.

The drywell temperature transient was analyzed and determined to not constitute a condition which prevented fulfillment of a safety function because 1) the GGN operating license permits brief periods in which the temperature limits are exceeded, and 2) the experienced temperature is bounded by the GGN safety analysis.

There was no challenge to protecting the health and safety of the general public because all Emergency Core Cooling Systems (ECCS) and Engineered Safety Features (ESF) equipment were operable and available prior to the shutdown. Operators followed the appropriate off-normal procedures and responded appropriately to the manual shutdown, temperature increases, and system realignments.

Previous Similar Events:

Entergy conducted a three year review, as described in NUREG-1022 guidance, and one similar event occurred.

A similar event in December of 2017 had the same direct cause but did not result in a manual plant scram action by the control room. The causes and resulting corrective actions that have been completed to date have not prevented the direct cause from occurring again in this event on May 12, 2019.